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09/772,989	01/31/2001	Hideki Morishima	2369.12210	2633

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EXAMINER

CHANG, AUDREY Y

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 02/28/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/772,989

Applicant(s)

MORISHIMA ET AL.

Examiner

Audrey Y. Chang

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. **Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

The phrase “synthesizing a synthetic parallax image” recited in claim 1 is indefinite since it is not clear how does the parallax image is synthesized. The stripe images, as claimed, contain images of “different view points” which is not clear if these “different view points” are referred to different eye positions of an observer or different eye positions for observer at different positions. It is not clear what is the synthetic parallax image if it contains information for more than two viewing points. As shown in Figure 10, the same stripe image is capable of contributing perspective images to all three different viewing points of the eyes, which is not feasible and this adds confusion to the nature or content of the claimed “synthetic parallax image”. Clarifications are required.

Claim 3 is confusing and indefinite since it is not clear what limitation(s) are stated here. It is not clear the cited “focal point” is referred to what.

Claims 5 and 7 are very confuse since it is not clear how are these “many straight lines” are defined. The alternative phrase “and/or” is indefinite since the second optical system and the image display element are two **different** elements placed at physically different positions.

The phrase “optical reduce distance” referred in claims 8, 9 and 10 is indefinite since it is not clear what does it mean.

The phrase “the first intersecting plane” recited in claim 8 is indefinite since it lacks proper antecedent basis from its based claim.

*Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-5, 7, 11-12, 14 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Ezra et al (PN. 5,703,717) in view of the patent issued to Mashitani et al (PN. 5,663,831).

Ezra et al teaches a *three dimensional display apparatus* that is comprised of a *spatial light modulator* (23, Figure 7), serves as the *image display element* for displaying a *spatially multiplexed 2D images* having stripes of image for different view points, a *lenticular screen* (42) placed in front of the image display element and an *angular amplifying element* (33) having a *first lenticular lens array* (34) for focusing the image at a *plane diffuser* (35) and a *second lenticular lens array* (36) for converging the image light passes through the plane diffuser to *different viewing locations*, (please see Figures 4 and 7, columns 4-5). The *lenticular screen* (42) and the *first lenticular lens array* (34) serves as the *second optical system* that condenses the stripe image to the plane diffuser and the *second lenticular lens array* (36) serves as the *first optical system*. Ezra et al teaches that the stripes of images for different view points are displayed on the spatial light modulator in an *interlaced* manner.

This reference has met all the limitations of the claims with the exception that it does not teach explicitly that the plane diffuser has a mask pattern of openings and shields. However it is known in the art that a plane diffuser that placed in front of the display element essentially has a mask pattern of openings and shields as demonstrated by the teachings of Mashitani et al wherein a diffusing plate (3, Figure 5) has a mask pattern of black regions and opening regions (i.e. images forming regions). It would

Art Unit: 2872

then have been obvious to one skilled in the art to make the plane diffuser of Ezra et al with mask pattern for the benefit of blocking unwanted light from the display to the observer.

With regard to claim 3, the focal point of the lenticular lens array (34) is at the position of the plane diffuser or the mask. The lenticular screen (42) implicitly forms the images of pixels on the plane diffuser in order for the three dimensional display apparatus to be operable.

With regard to claim 4, Ezra et al teaches the number of viewing locations or viewing points are more than 2.

With regard to claims 5 and 7, the features are implicitly included in the disclosure of Ezra et al by simply doing image rays tracing.

With regard to claims 11, 12 and 14, Ezra et al teaches that the first and second optical systems, as defined above, comprise lenticular lenses, but it does not teach explicitly that they may also include microlens arrays and/or with toroidal lenses. However microlens array with toroidal lenses are quite well known in the art and it is an equivalent means with respect to the lenticular lenses in the display art. Also since the specification fails to teach the criticality of having these particular lens arrays would overcome any problem in the prior art such modifications are considered to be obvious matter of design choices to one skilled in the art.

The method for stereoscopic image display is implicitly included in the disclosure of the three dimensional display apparatus.

**5. Claims 6, 13 and 16 dependent wherefrom are rejected under 35 U.S.C. 103(a) as being unpatentable over the patents issued to Ezra et al and Mashitani et al as applied to claims 1 and 15 above, and further in view of the patent issued to Inoguchi et al (PN. 6,061,179).**

The three-dimensional display apparatus taught by Ezra et al in combination with the teachings of Mashitani et al as described for claims 1 and 15 above have met all the limitations of the claims with the

Art Unit: 2872

exception that they do not teach explicitly that the lenticular screen and lenticular lens array for the second optical system comprise lenticular lens having cylindrical lenses arranged along the vertical direction and a lenticular lens having cylindrical lenses arranged along horizontal direction. Inoguchi et al in the same field of endeavor teaches such lenticular lenses arrays combination (3H, Figure 1) for properly focusing image light between the image display element and the mask. It would then have been obvious to one skilled in the art to apply the teachings of Inoguchi et al to modify the second optical system by the lenticular lenses arrays combination having different refractive power in vertical and horizontal direction respectively for the benefit of ensuring the focusing of the image light between the image display element and the mask or planer diffuser.

*Allowable Subject Matter*

6. Claims 8, 9 and 10 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter: of the prior art references none has disclosed a stereoscopic image display method including the claimed structural combination and the claimed distance relationships claimed among the various element in the structural combination.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 703-305-6208. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on 703-308-1637. The fax phone numbers for the organization where

Art Unit: 2872

this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

*Audrey Y. Chang*  
*Primary Examiner*  
*Art Unit 2872*

A. Chang, Ph.D.  
February 22, 2002

A handwritten signature in black ink, appearing to be 'Audrey Y. Chang', written in a cursive style.